

FIG. 1

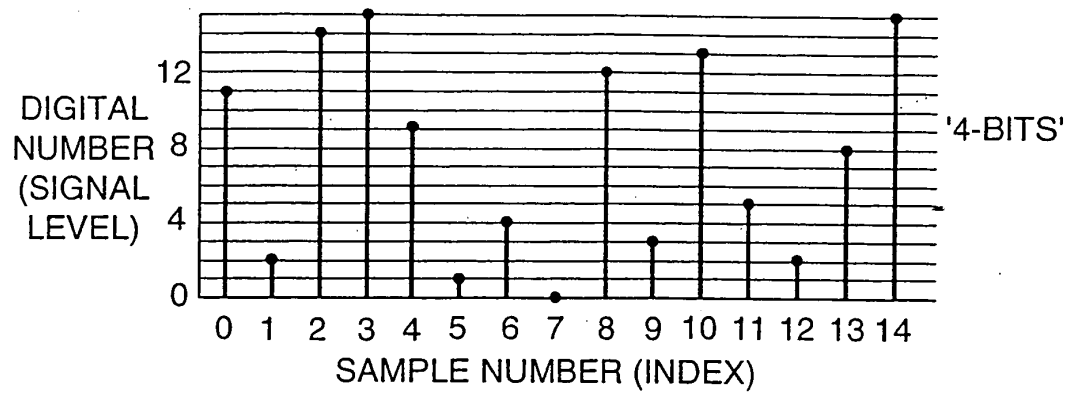


FIG. 4

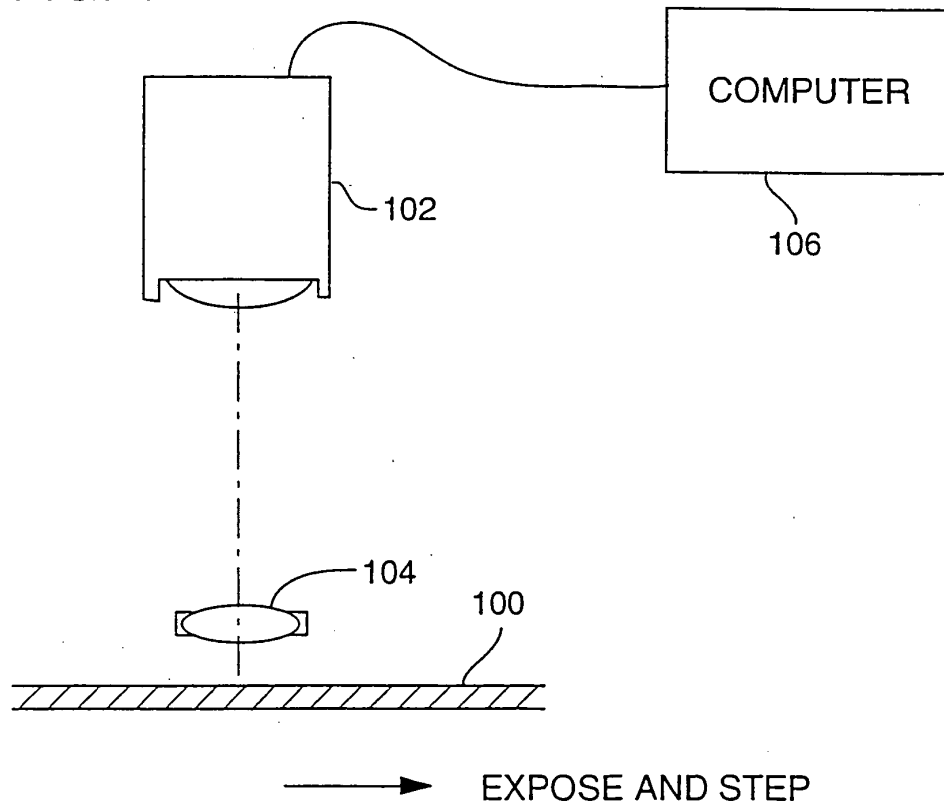




FIG. 2

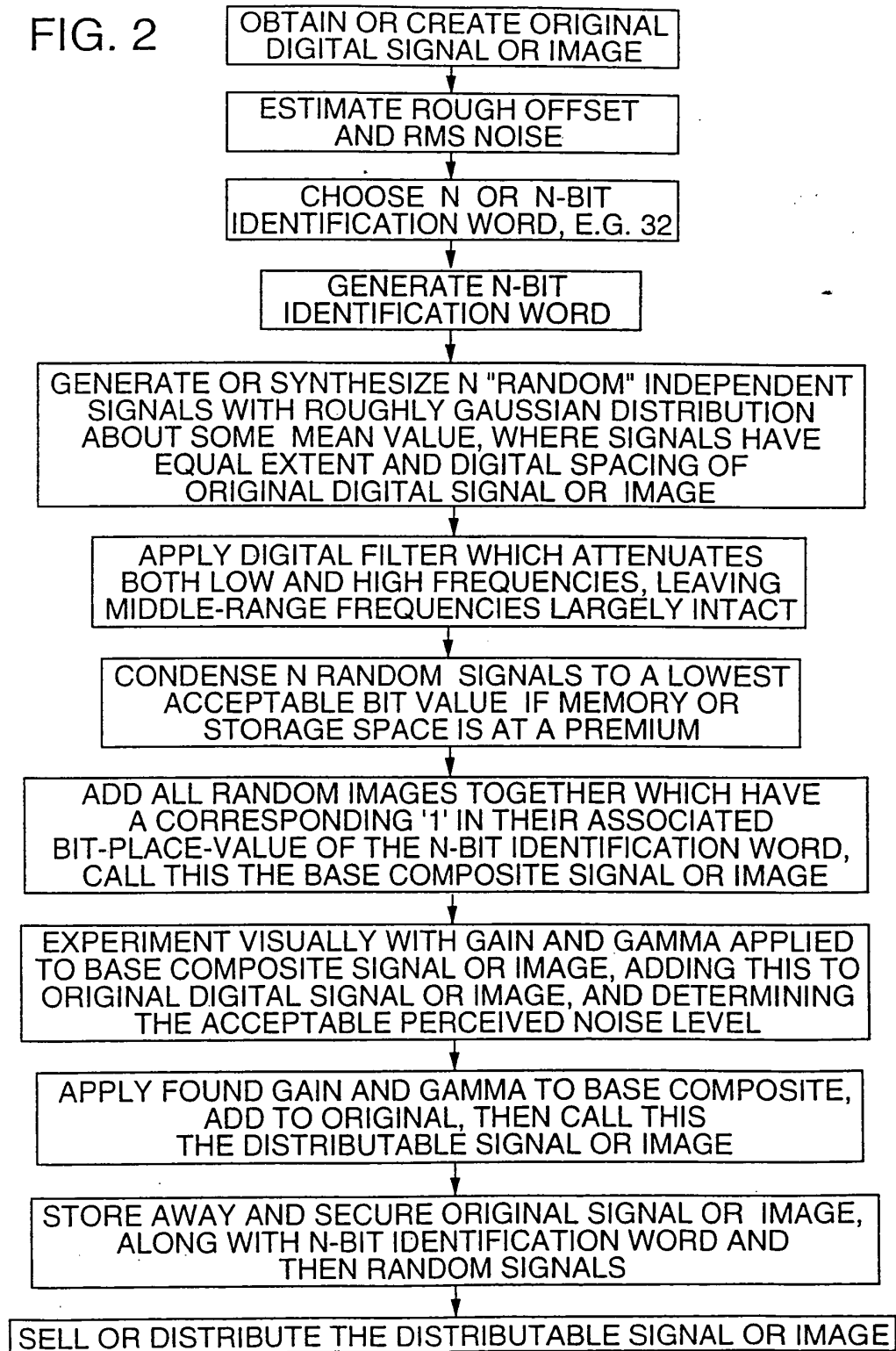
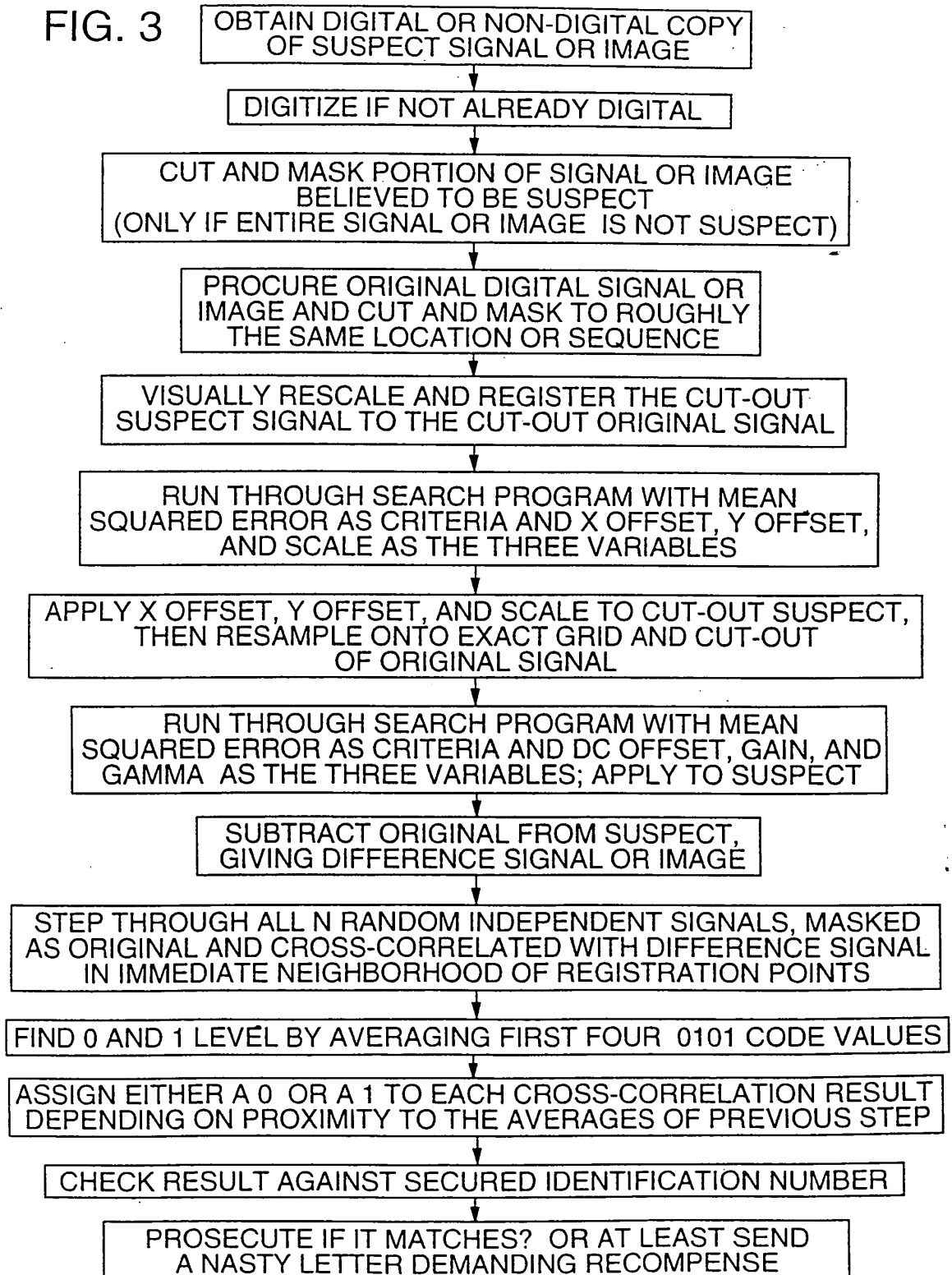




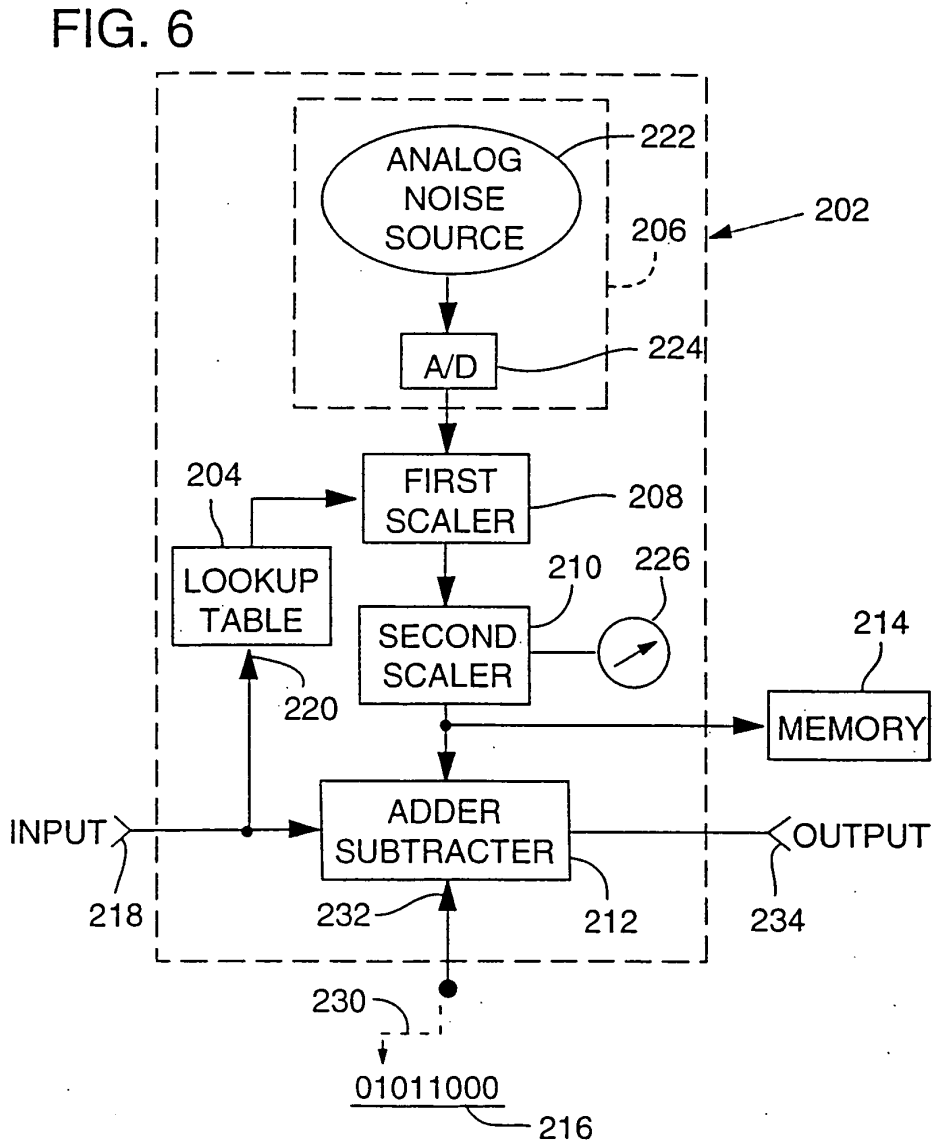
FIG. 3



SECRET



25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																									
1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100





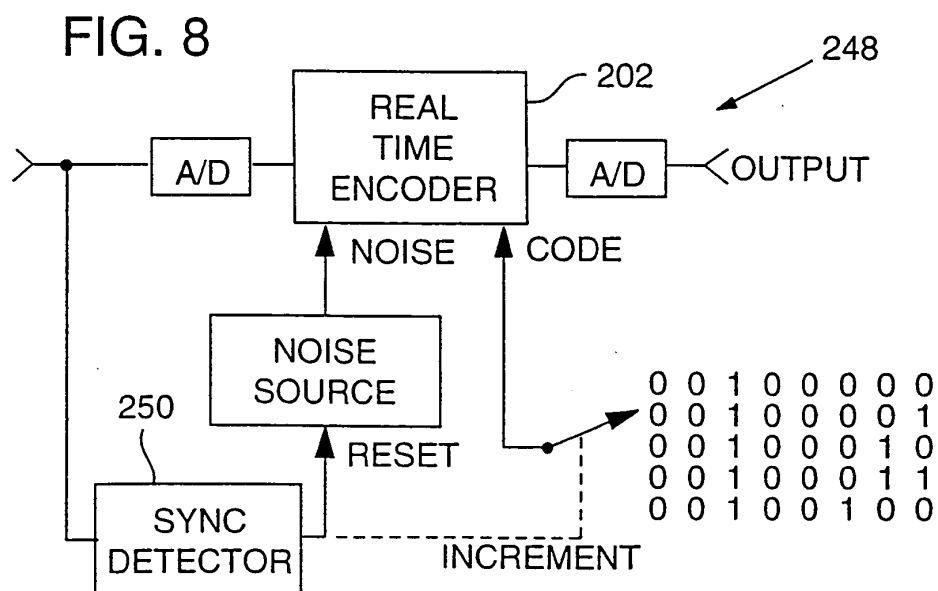
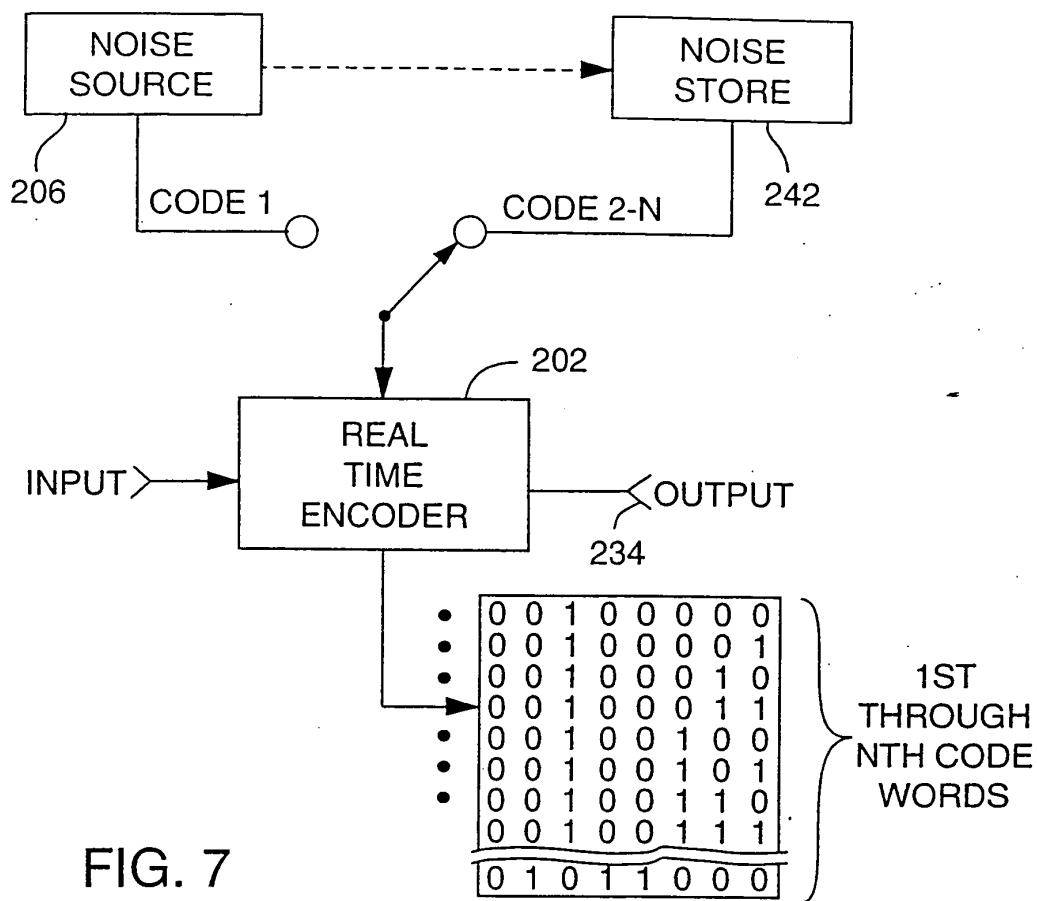




FIG. 9A

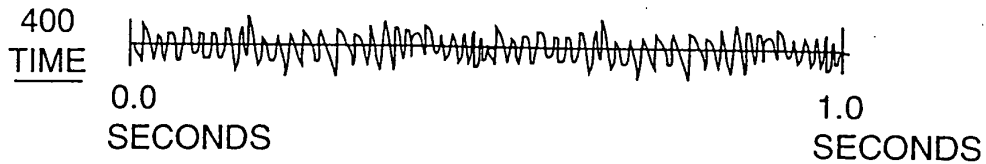


FIG. 9B

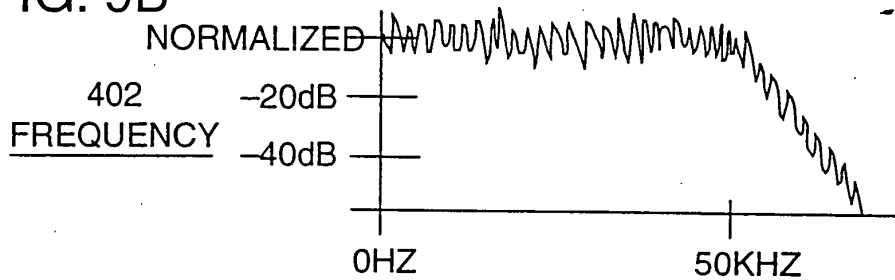


FIG. 9C

BORDER  
CONTINUITY  
404

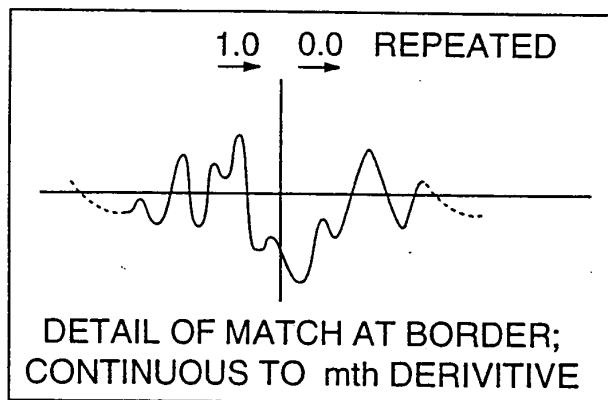


FIG. 10

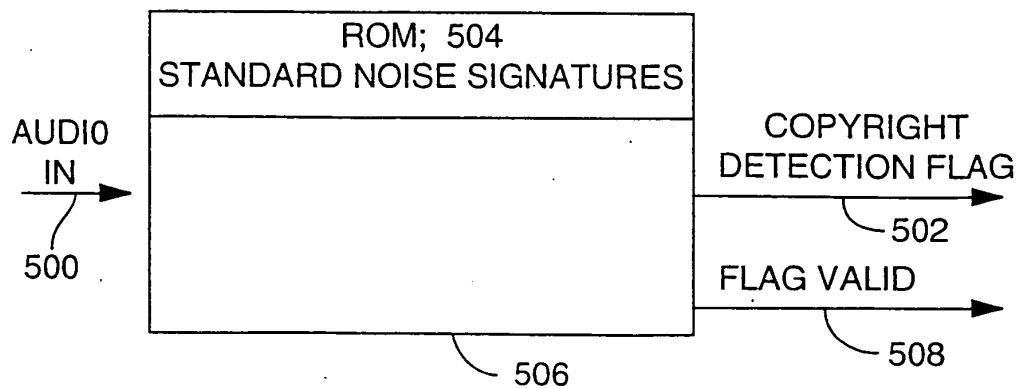




FIG. 11

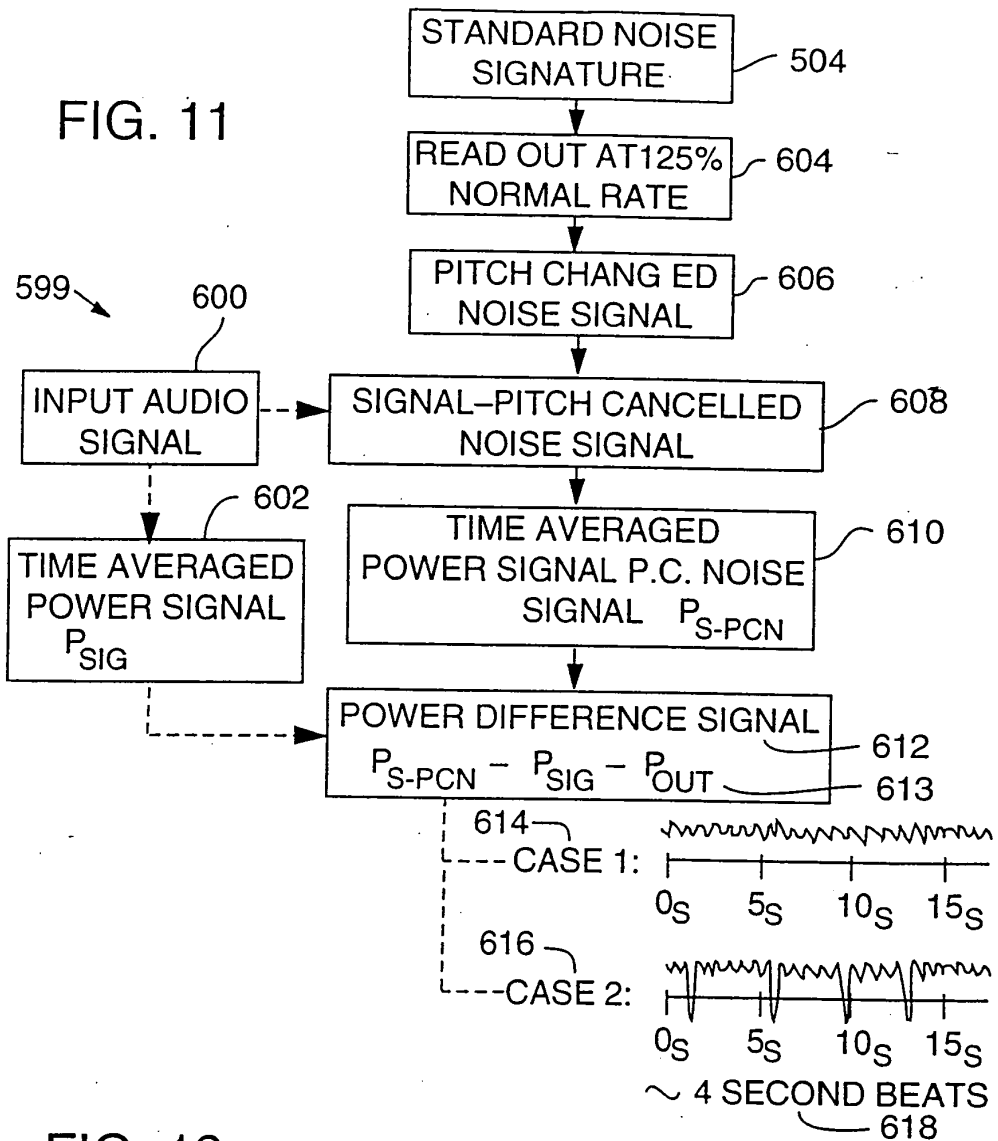


FIG. 12

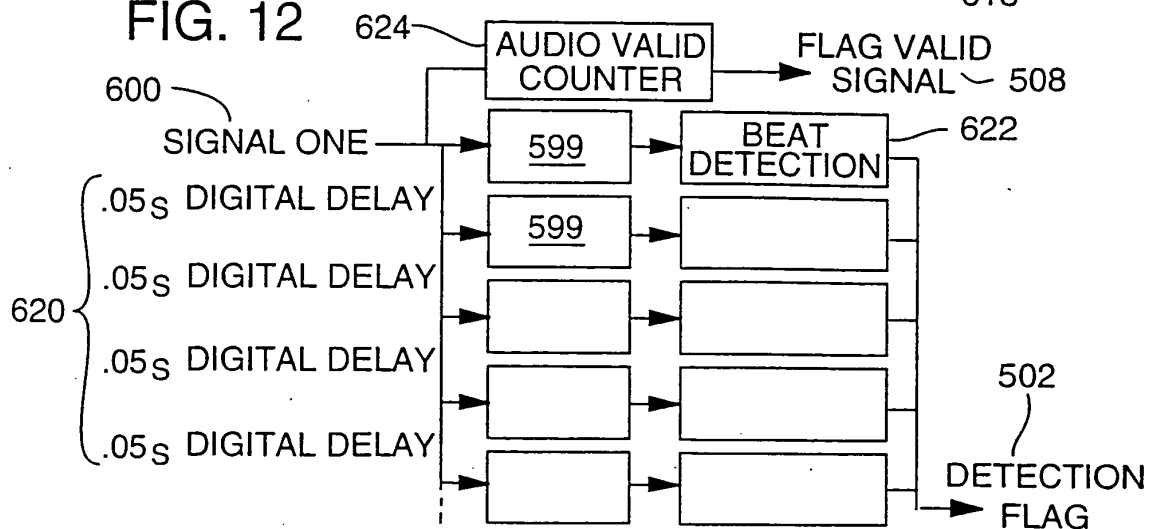
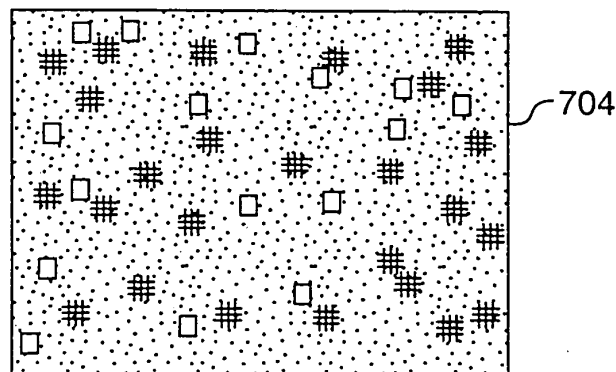
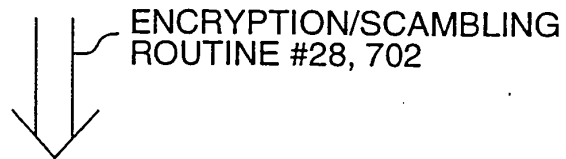
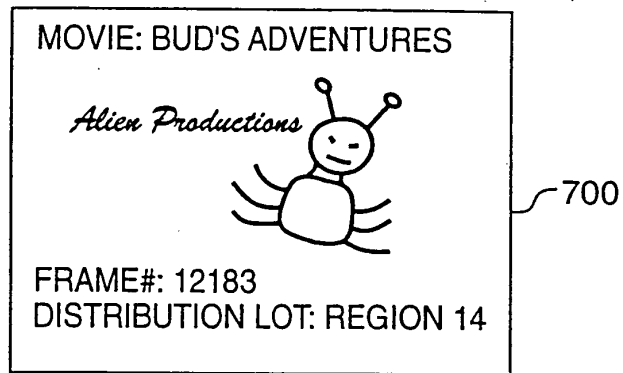




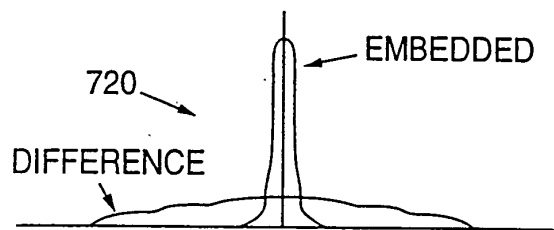
FIG. 13



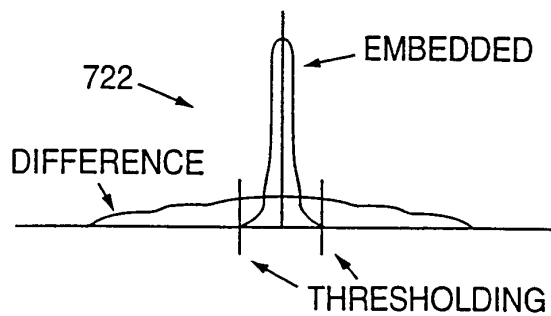
PSEUDO-RANDOM MASTER SNOWY IMAGE  
(SCALED DOWN AND ADDED TO FRAME 12183)



FIG. 14



MEAN-REMOVED HISTOGRAMS OF  
DIFFERENCE SIGNAL AND KNOWN EMBEDDED  
CODE SIGNAL



MEAN-REMOVED HISTOGRAMS OF  
FIRST DERIVATIVES (OR SCALAR GRADIENTS  
IN CASE OF AN IMAGE)



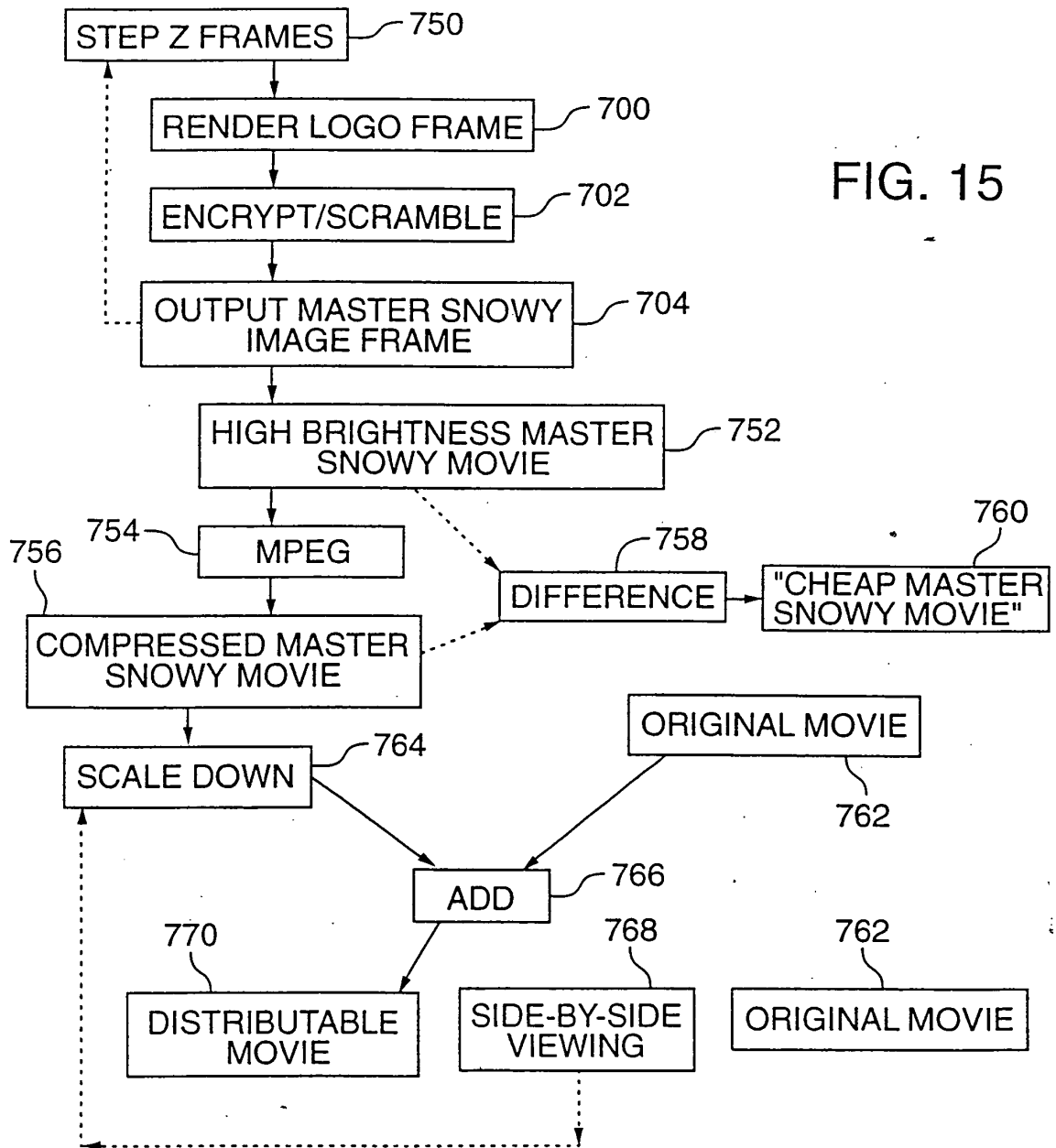
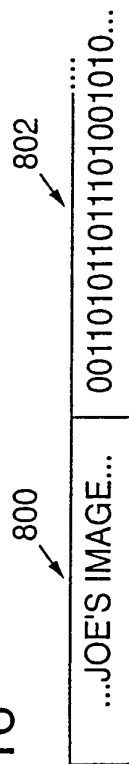


FIG. 15



FIG. 16



HEADER DATA STREAM

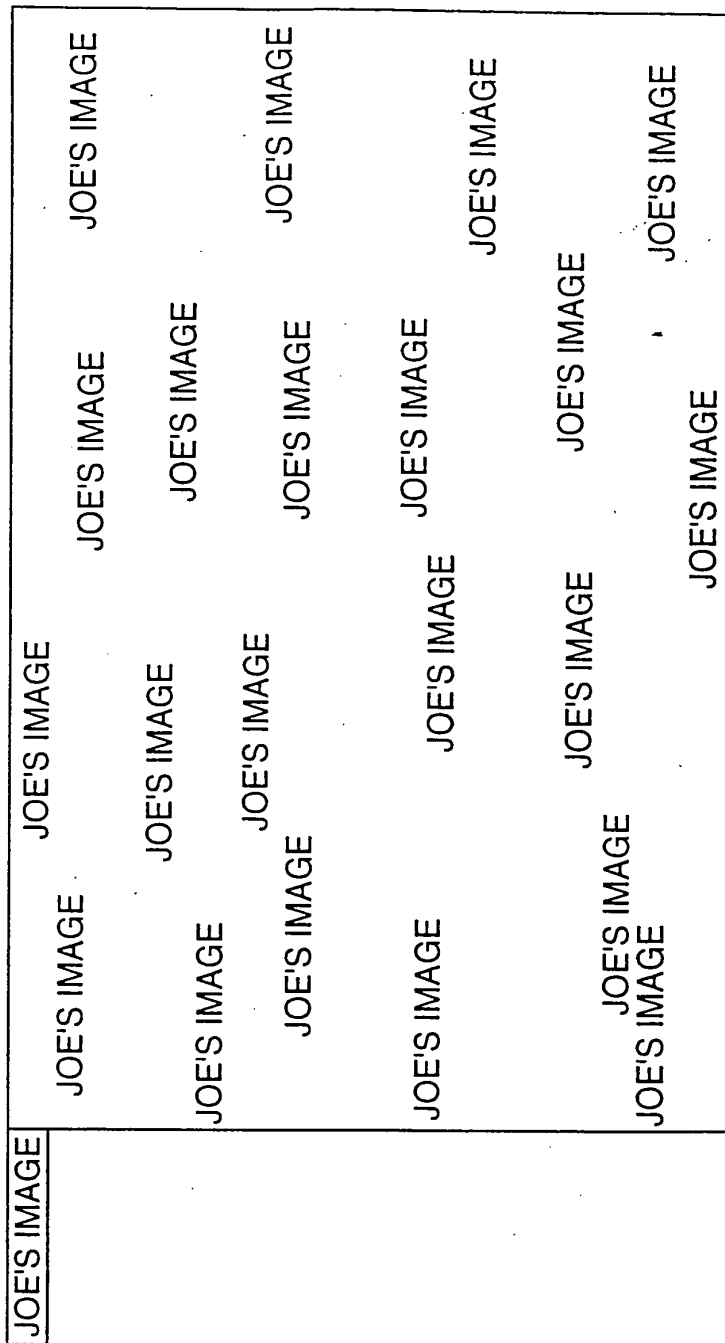




FIG. 17

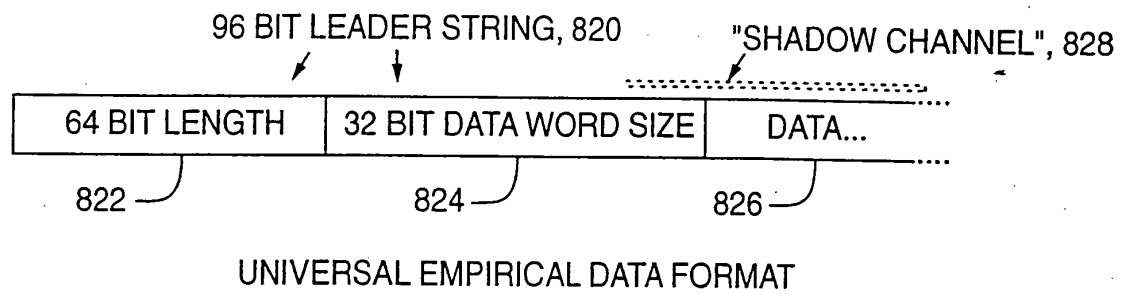


FIG. 18

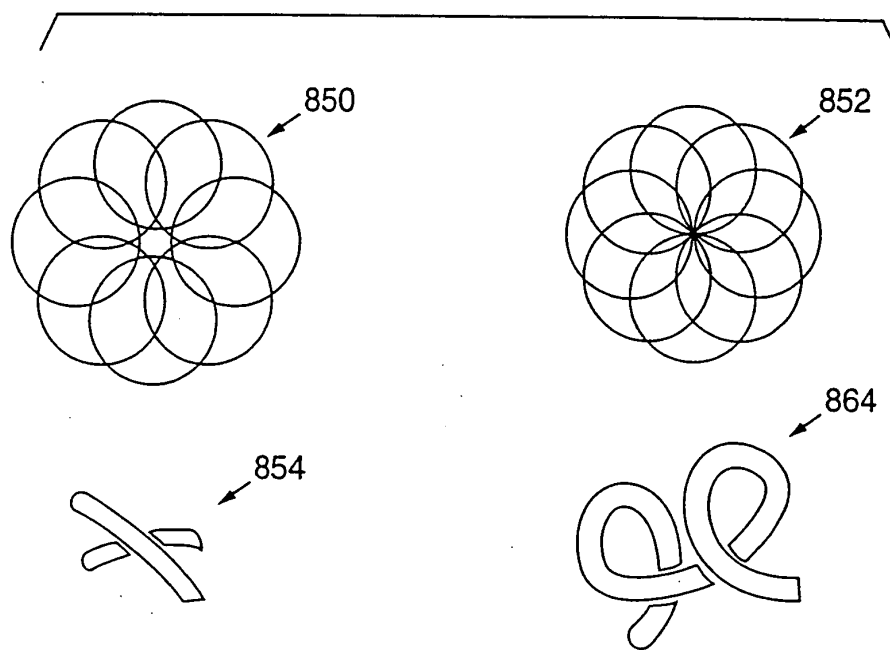




FIG. 19

866

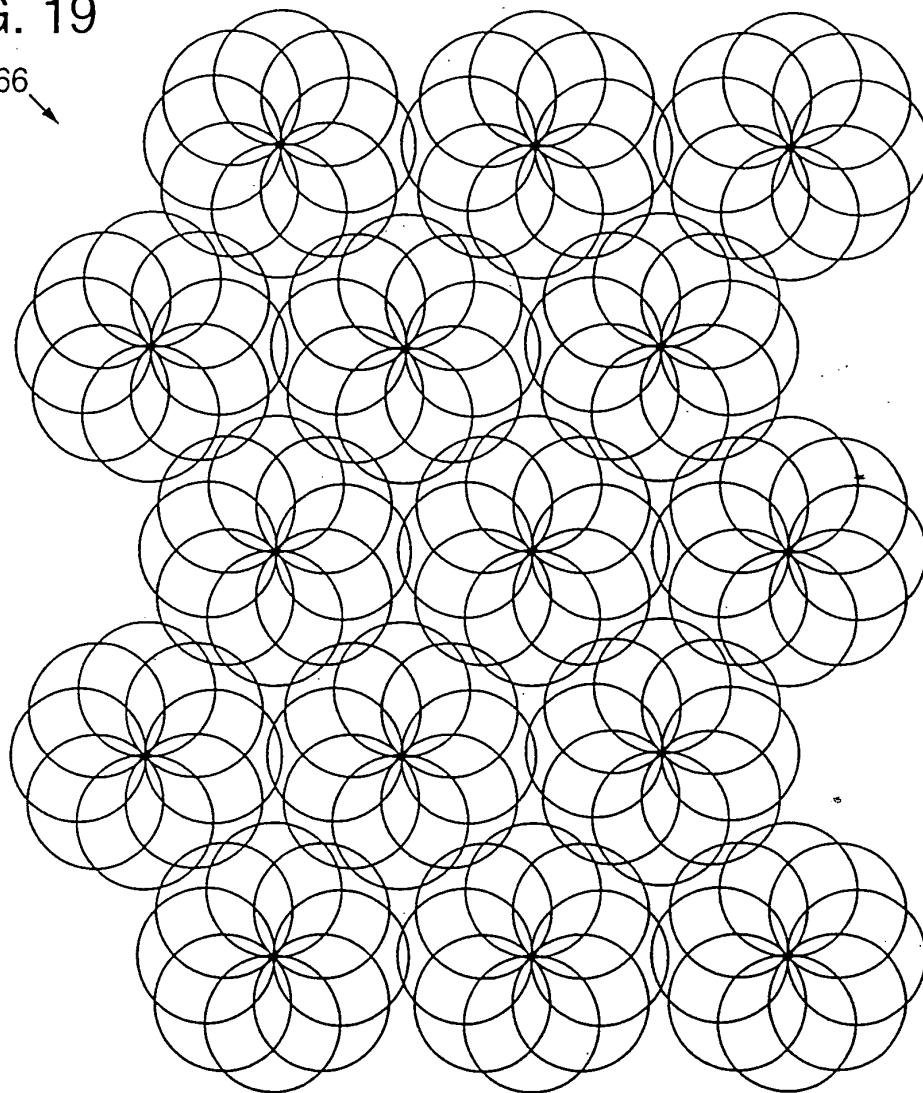


FIG. 20

BRIGHTNESS  
PROFILE, 874

CENTER POINT OF  
RING, 872

NOMINAL DISTANCE  
TO CENTER OF OUTER  
RING WIDTH, 870

NOMINAL DISTANCE  
TO CENTER OF OUTER  
RING WIDTH, 870

876

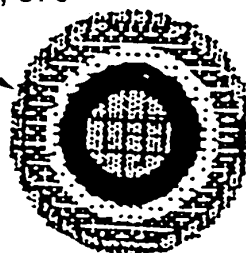




FIG. 21A

900

C	2C	C
2C	4C	2C
C	2C	C

WHERE  $C = 1/16$

FIG. 21B

...	2	3	4	5	6	7	0	...	
...								...	
...	6	7	0	1	2	3	4	...	
...				C	2C	C		...	
...	2	3	4	2C	4C	2C	6	7	0
...				C	2C	C			
...	6	7	0	1	2	3	4		
...									
...									

FIG. 23

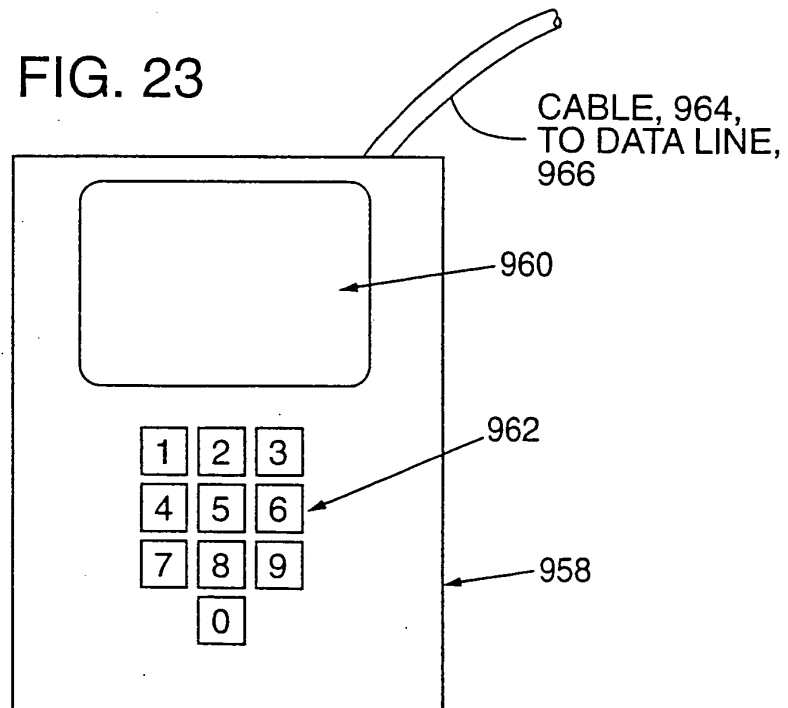




FIG. 22

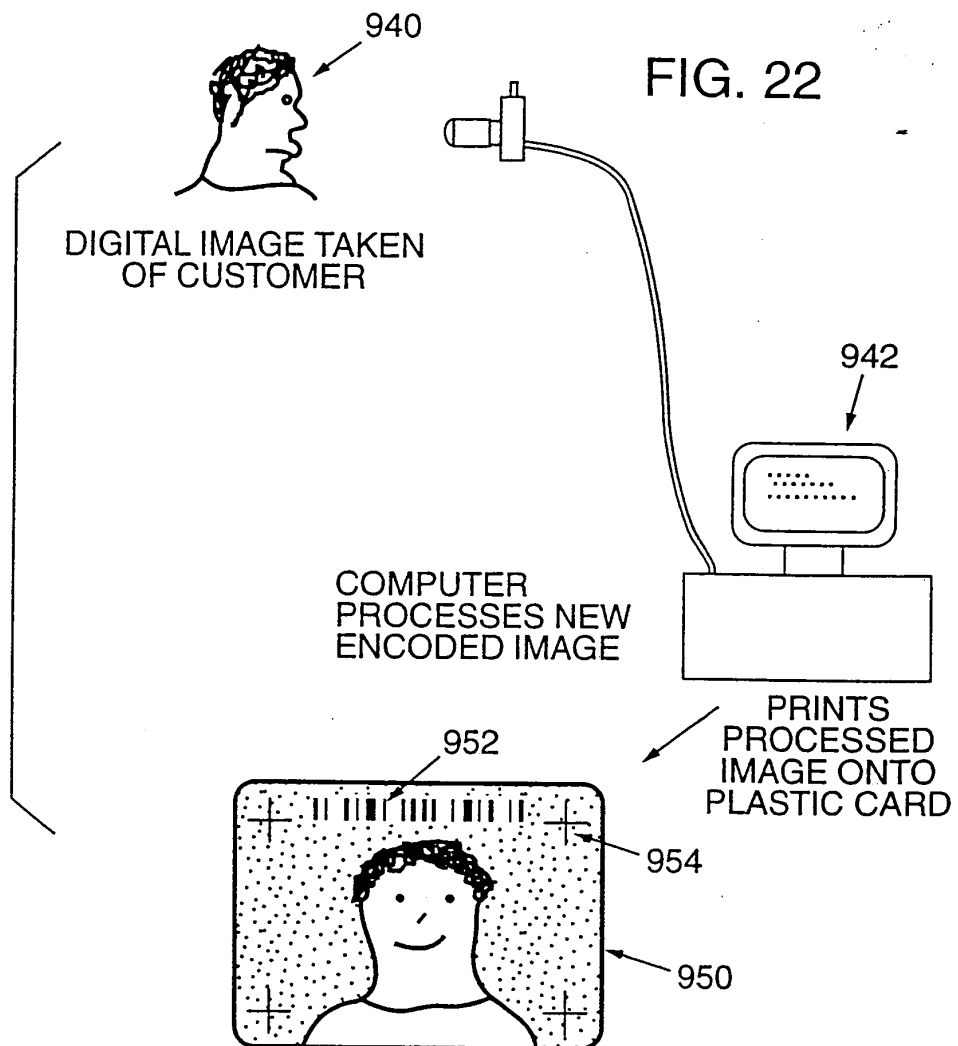




FIG. 24

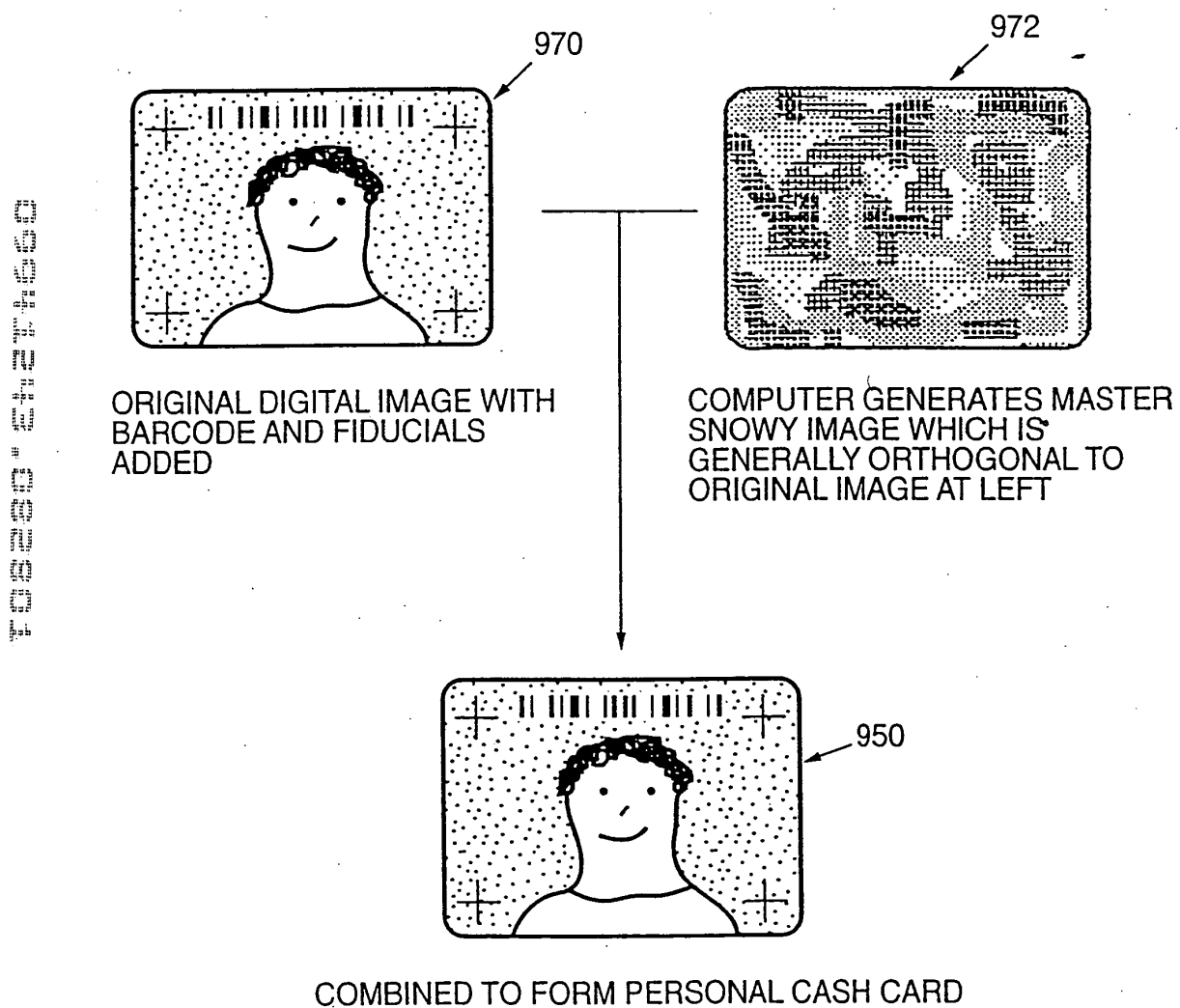




FIG. 25 TYPICAL TRANSACTION STEPS

1. READER SCANS IMAGE ON CARD, STORES IN MEMORY, EXTRACTS PERSON'S ID
2. OPTIONAL: USER KEYS IN PIN NUMBER
  3. READER CALLS CENTRAL ACCOUNT DATA NETWORK, HANDSHAKES
  4. READER SENDS ID, (PIN), MERCHANT INFORMATION, AND REQUESTED TRANSACTION AMOUNT TO CENTRAL NETWORK
  5. CENTRAL NETWORK VERIFIES ID, PIN, MERCHANT INFO, AND ACCOUNT BALANCE
  6. IF OK, CENTRAL NETWORK GENERATES TWENTY-FOUR SETS OF SIXTEEN DISTINCT RANDOM NUMBERS, WHERE THE RANDOM NUMBERS ARE INDEXES TO A SET OF 64K ORTHOGONAL SPATIAL PATTERNS
  7. CENTRAL NETWORK TRANSMITS FIRST OK, AND THE SETS OF RANDOM NUMBERS
8. READER STEPS THROUGH THE TWENTY-FOUR SETS
  - 8A. READER ADDS TOGETHER SET OF ORTHOGONAL PATTERNS
  - 8B. READER PERFORMS DOT PRODUCT OF RESULTANT PATTERN AND CARD SCAN, STORES RESULT
  9. READER TRANSMITS THE TWENTY-FOUR DOT PRODUCT RESULTS TO CENTRAL NETWORK
  10. CENTRAL NETWORK CHECKS RESULTS AGAINST MASTER
  11. CENTRAL NETWORK SENDS FINAL APPROVAL OR DENIAL
  12. CENTRAL NETWORK DEBITS MERCHANT ACCOUNT, CREDITS CARD ACCOUNT



FIG. 26

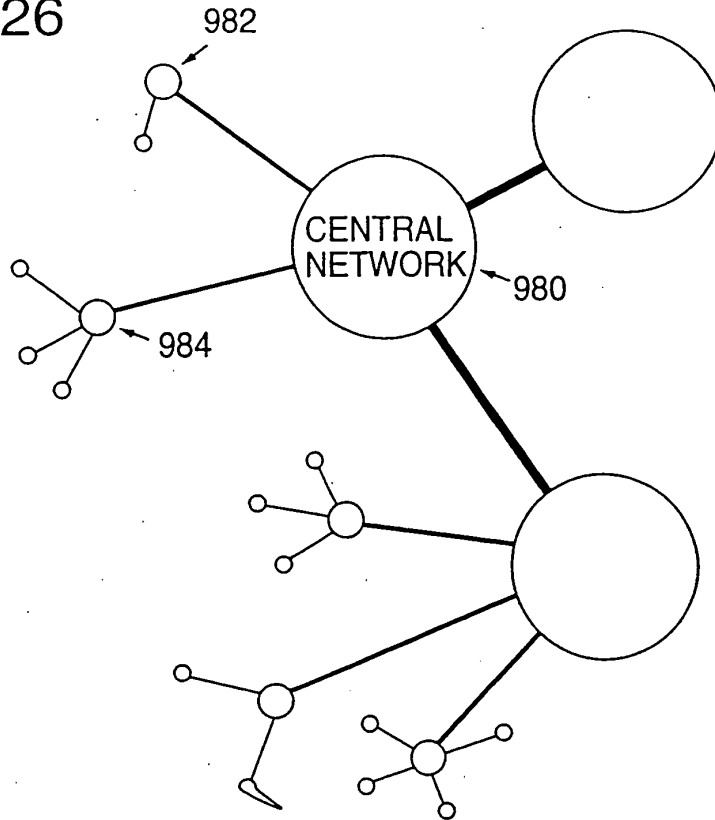


FIG. 27

